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**Experiments and simulations of single shock Richtmeyer-Meshkov Instability with measured, volumetric initial conditions** EVEREST SEWELL, KEVIN FERGUSON, The University of Arizona, JEFFREY GREENOUGH, Lawrence Livermore National Laboratory, JEFFREY JACOBS, The University of Arizona — We describe new experiments of single shock Richtmeyer-Meshkov Instability (RMI) performed on the shock tube apparatus at the University of Arizona in which the initial conditions are volumetrically imaged prior to shock wave arrival. Initial perturbation plays a major role in the evolution of RMI, and previous experimental efforts only capture a narrow slice of the initial condition. The method presented uses a rastered laser sheet to capture additional images in the depth of the initial condition shortly before the experimental start time. These images are then used to reconstruct a volumetric approximation of the experimental perturbation, which is simulated using the hydrodynamics code ARES, developed at Lawrence Livermore National Laboratory (LLNL). Comparison is made between the time evolution of the interface width and the mixedness ratio measured from the experiments against the predictions from the numerical simulations.

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